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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/388,509	09/02/1999	YASUSHI MARUTA	P/1905-86	4093

7590 07/26/2002

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EXAMINER	
WILLIAMS, DEMETRIA A	
ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 07/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/388,509	MARUTA ET AL.	
	Examiner	Art Unit	
	Demetria A. Williams	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 September 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5 and 7* is/are rejected.

7)☒ Claim(s) *2,6,8 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4,5,6,7* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed on April 30, 2001 (Paper Number 6) fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

2. The information disclosure statement filed on February 1, 2001 (Paper Number 5) fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the items listed under "Other Documents" have not been considered, as no copies were included.

3. The information disclosure statement filed May 9, 2002 (Paper Number 7) fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the Japanese Office Action referred to therein has not been considered because no copy was received.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 3, 4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keskitalo et al ("Keskitalo" hereinafter).

Referring to claim 1, Keskitalo discloses an array antenna reception device comprising multiple antenna array elements (column 5, lines 60-61; figure 4, elements 400-404); a number of RF parts, functioning as the K adaptive receivers of the pending claim (column 5, lines 62-64; figure 4, elements 406-410), which receive signals from the antenna elements, said received signals having a gain in a desired signal direction (column 6, lines 43-46); and a means functioning as the signal synthesizer of the pending claim for weighting and synthesizing the

demodulated signals (column 5, lines 66-67; column 6, lines 1-3; figure 4, elements 412-420) and outputting a demodulated signal. While Keskitalo does not specifically disclose the number of sectors included, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose a number, such as an integer of at least 3, because the advantages such as interference reduction increases as the number of sectors increases (column 2, lines 12-22).

Referring to claims 3 and 4, Keskitalo discloses that the best signal components of the received signal are searched for in such a way that the detected components can be combined and detected. Keskitalo further discloses that the metric used can be the signal power or the signal to noise ratio (column 5, lines 47-54). Thus it would have been obvious to one of ordinary skill in that art at the time of the invention to select components, as taught by Keskitalo, having the maximum signal power or signal-to-noise (or interference) ratio because the stronger the signal, the easier it is to detect.

Regarding claim 7, Keskitalo discloses a despread means for receiving CDMA signals and despreading each signal using a desired spread code (column 7, lines 5-8), arrival direction estimation means for estimating an arrival direction from the output of the despread means (column 7, lines 13-15), antenna weight generation means for generating antenna weights and a weighting synthesizer for forming directional patterns from the antenna weights (column 6, lines 4-18), and a demodulator for estimating a transmission path (column 7, lines 14-35).

7. Claims 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keskitalo in view of Asanuma et al ("Asanuma" hereinafter). Keskitalo discloses all of the elements as described above in reference to claim 1, but does not disclose the use of maximum ratio synthesis in maximizing the signal to interference ratio. Asanuma disclose a receiver system whereby

weighting coefficients are based on signal and interference powers. Asanuma further discloses that when maximum ratio synthesis is performed, a reception signal with a higher desired-undesired signal ratio can be obtained (column 3, lines 50-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of Keskitalo to include the use of maximum ratio synthesis, as done by Asanuma in order to obtain a maximum ratio of signal power (desired) to interference power (undesired).

Allowable Subject Matter

8. Claims 2, 6, 8, and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2, prior art of record does not disclose that the directional pattern of each sector is formed outside of the polygon.

Regarding claim 6, prior art of record does not disclose the multiplication of a user determination symbol by a transmission path estimation value in order to cancel a phase change caused by phase lock of a carrier wave.

Claims 8 and 9 depend from claim 6 and thus contain the same allowable subject matter.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sato et al discloses an adaptive array system whereby signals are chosen based on maximum power and maximum signal to interference ratio, and the use of a root-mean square calculation to minimize error when determining weight coefficients.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Demetria A. Williams whose telephone number is (703) 305-4078. The examiner can normally be reached on Monday - Friday, 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (703) 305-4378. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

daw
July 18, 2002

CHI PHAM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600 7/24/02